The Otter.
Lutra Vulgaris.

THE ZOOLOGIST

No. 205.—January, 1894.

THE OTTER, *LUTRA VULGARIS.*

By the Editor.

Few animals have been more maligned than the Otter, or more misunderstood. The majority of people know little or nothing of its habits from personal observation, and are under the impression that, as it is a great destroyer of fish, its presence in a trout-stream, or salmon river, is on no account to be tolerated. But "live and let live" is a very wholesome motto, and we shall always maintain that so long as the fishery-laws of this country are respected, and illegal netting is prevented, there will be always enough fish in our rivers for anglers and otters too.

Moreover, it is a fallacy to suppose that the Otter, as stated by Bell in his 'British Quadrupeds,' "lives exclusively on fish." This is by no means the case, as we shall presently show; nor is it the fact that it confines its attention to salmon and trout, despising the coarser kinds. But before treating of its food, it will be proper to say something of its structure, so well adapted as it is to the creature's habits.

In the Otter we find the general organization of the Weasel family specially modified for an aquatic life. The skull shows some approach in form to that of the Seals, being short, oval, broad, and much flattened, with the occipital region strongly developed. Between the orbits it is much compressed, so that the eyes look upwards. The molar-teeth have very sharp tubercles, well fitted to retain their grip of hard-scaled and slippery fish. The limbs are short but powerful, with very flexible joints, permitting every freedom of movement in swimming. The intestine, as in most piscivorous animals, is of considerable length; in an example examined by Macgillivray it measured 10 feet 10 inches. Externally the head is oval and depressed, with a broad obtuse muzzle, naked round the nostrils, and provided with long stiff whiskers. The ears, provided with a fold of skin which closes them when the animal dives, are short and rounded, almost concealed by the hair. The body is lengthened and depressed, the tail flattened and rudder-like, the toes webbed to the claws. A close coating of fine silky under-fur protects the animal from cold, while the outer covering of close-lying glossy hair presents no resistance in passing through the water. Thus every detail in its structure combines to fit the Otter for its amphibious life, and to enable it to pursue its prey in the water with a rapidity, ease, and grace in which it is only surpassed by the Seals.

There is one peculiarity in its anatomy which has generally escaped observation—namely, the smallness of the gullet. Those who have watched an Otter feeding, as we have done repeatedly, must have noticed that instead of tearing out large pieces of flesh and bolting them like a dog, with very little mastication, it feeds more like a cat, with the head on one side, biting very small pieces at a time, and champing and chewing them well before swallowing. From this point of resemblance "water-cat" would be a more appropriate name for it than "water-dog."*

The smallness of the animal's gullet is no doubt correlated with its habit of seizing prey under water. It is thus enabled by muscular contraction to close the gullet while the mouth is open, and so to escape suffocation.

That the Otter is able to remain a long time under water without coming up to breathe, or "vent" as it is technically termed by otter-hunters, is a fact well known to the fraternity.

It is also said to be able to travel under the ice, and an ingenious explanation has been given by an American observer of the mode by which it is enabled to obtain a sufficient supply of air during submersion. He says:†—

> "As we all know, there is no air space between the water and the ice, and the Otter cannot draw the air through the ice from above, and does not put his nose up there to cool it. Then what is the explanation? It is

---

* The name "Water-dog" is given to it both in Ireland and Wales. The Irish call it *Maclaidh uisce*, or *Dobharchu*, and the Welsh *Dyfrgi*.

† 'Forest and Stream,' March 14th, 1889.

this, and a very interesting and scientific process, not generally known. The Otter presses his nose against the ice, then exhales the air from his lungs, which forms a flat air-bubble around his nose, and between the ice and water; the air is allowed to remain there a few seconds, and thus by its contact with the ice and water is cooled, purified and re-oxygenated, then the same is inhaled into the lungs, and the Otter is ready for a new start; this may be repeated for a number of times, until the loss and wastage of air requires a new supply. You will at once see the beauty and usefulness of the process. The Beaver and some other animals do the same, to enable them to 'live under the ice a long time, without taking breath.'"

We are not able to confirm this from personal observation, and may remark that upon the only occasion that we know of, when an Otter plunged through a hole in the ice at the side of a lake, it was drowned, and the body was not recovered until the ice broke up. This was a tame Otter belonging to Mr. Assheton Smith, of Vaynol Park, North Wales, which was accustomed to follow its master in his walks. It would hunt a trout-stream for his diversion, coming back when called, like a dog, and was quite accustomed to the lake above mentioned, from which we have often seen it bring out a fish.

Apropos of Otters on the ice, a curious incident happened during a severe frost in December, 1879. A farmer, residing near the river Irfon, a short distance above Llanwrtyd Wells, when walking by the river observed a great commotion in the water close to the edge of some thick ice; on going nearer he found it was caused by an Otter, which, strange as it may appear, was firmly frozen by its tail to the ice. Probably the Otter had been for some time sitting on the edge of the ice in wait for a passing fish, and on plunging in to secure its prey, found itself in durance vile. The poor beast's nails were quite worn to the flesh by scratching against a rock, and its teeth broken by biting the ice in its vain attempt to free itself. The Otter was secured and taken home by the farmer, but died the same night.

That Otters are capable of being tamed and trained there is abundant evidence to show. We might quote Albertus Magnus, Aldrovandus, Gesner, and other ancient writers to prove this, but more modern testimony will be preferred. Every angler will remember the passage in Izaak Walton where "Piscator" expresses a wish to have one of the young Otters which the huntsman had found, and exclaims, "I pray, Sir, save me one;

and I'll try if I can make her tame, as I know an ingenious gentleman in Leicestershire, Mr. Nicholas Seagrave, has done; who hath not only made her tame, but to catch fish, and do many other things at pleasure."

Goldsmith mentions an Otter which would plunge into a pond at word of command, and driving the fish up into a corner, would seize upon one of the largest and bring it to land. Bewick, Shaw, Daniel, Macgillivray, and Bishop Heber (in his 'Indian Journal'),* record instances of the animal's docility in this way; and McDiarmid, in his 'Sketches from Nature,' gives an account of several tame Otters, one of which, belonging to a poor widow, kept her well supplied with fish from the river Urr and its tributary streams. One kept at Corsbie House, Wigtonshire, he says, evinced a great fondness for gooseberries; and another belonging to Mr. Monteith, of Carstairs, though very tame, would steal away at night to fish by moonlight, returning to his kennel in the morning. A cobbler at Rothbury, on the Coquet, had a tame Otter, which was allowed its liberty, and would go off to fish and return to the house, bringing a Trout, after helping himself. He lived about five years, and was then accidentally killed in a gale of wind by a door slamming against him and crushing him.

Our old friend, Mr. F. H. Salvin, of Whitmoor House, near Guildford, has reared and tamed many young Otters, and has proved them to be most delightful pets. He writes:—

> "My reason for saying that Otters do more good than harm is that they kill those fish which destroy spawn and young fry, and their presence really indicates an increase of the best fish, such as Trout, Grayling, and Salmon."

As regards the power of the Salmon in ordinary water to escape the Otter by superior swimming, it is certain, whatever the theory upon the matter may be, that the Otter does constantly take Salmon in all sorts of water, as any angler of experience can testify. We have heard of a case in which an Otter was seen in a deep long pool to capture a grilse of 6 lbs. or 7 lbs. weight in the height of the season. Mr. F. H. Salvin once witnessed a struggle between a tame Indian Otter, belonging to Mr. Hulse, of the Rifle Brigade, and a large Pike in a deep pond in Stoke Park, near Guildford. The Pike was eventually beaten, and on being landed was found to weigh 20 lbs. 11 oz., while the Otter weighed but 18 lbs.

---

* Azara gives an account of a South American Otter, *Lutra braziliensis*, which answered to its name, and followed its owner like a dog. See also Jerdon's account of the Indian Otter, *Lutra nair*, in his 'Mammals of India,' and Swinhoe on the habits of a tame Otter, *Lutra Swinhoei*, Gray, which was captured on the island of Gawkang, near Amoy. Proc. Zool. Soc. 1870, p. 625.

"The fish," says Mr. Salvin, "which I find they generally kill are Roach, Dace, Chub, Loach, Miller's-thumb, Jack, and Eels. Many of these fish take to the sides upon seeing their enemy, and he surprises them under the banks, where they fondly imagine they are hidden from view, and consequently safe. I believe they kill a considerable number of Water Rats, and I know they catch Water-hens. I have seen an Otter of mine hunt one like a Spaniel."

We have received confirmation of this from a gamekeeper of Lord Egmont's, as well as from Lieut.-Col. Levett, of Mitford Hall, Stafford, who wrote that in January, 1881, he saw an Otter with a Water-hen in its mouth, with which it dived at his approach, and he subsequently found the spot where the bird had been killed. In hard weather it would seem that Otters are compelled to take other food besides fish, which are then not so easily procured.

Mr. S. J. Hurley, of Killaloe, who has had many tame Otters, wrote in Sept. 1889:—

"You may take my word for it that Otters, when hard pressed for food, do hunt and kill Water-hens, and, indeed, other species of water-fowl as well. On one occasion I even caught an Otter in the act of killing a goose. I had been out one morning fishing in a tributary of the Shannon, and as I turned a somewhat sharp bend in the river, I found Madame *Lutra* tearing the feathers off a goose which she had just killed. I have kept tame Otters for many years past, so know something about them. One beauty that I had used to hunt everything she met with, both on land and in water—fish, feather, and fur. One day, in winter, we were going after the Snipe in the marsh, where it was impossible to work without a retriever. My favourite Irish water spaniel being laid up at home at the time, I could not bring her, but thought I would give Loo (the Otter) a chance of signalising herself. I took her to the marsh, and no spaniel in the world could have performed better. She put up the Snipe splendidly, and retrieved any birds that fell into the big pools or bog-holes."

In Nov. 1885, Mr. Gow, gamekeeper at Dalnaspidal, in Perthshire, came upon the track of an Otter in the newly-fallen snow by the side of a mountain stream. Having his gun with him, he followed the trail in the hope of falling in with the Otter. After proceeding a short distance, the tracks left the water-side, and showed where the animal had made a bound and caught an old cock Grouse. Returning to the stream, it had crossed on to a rock in the centre of the water, where it deposited its prey. To those acquainted with the feeding peculiarities of the Otter, it will not be surprising to learn that it did not finish the bird at its nocturnal meal, but left well-nigh one-half of the Grouse upon the rock. Mr. Gow, after examining the remaining portion of the Grouse, followed the track of the Otter up stream until it terminated in a deep moss-hole, where the object of his pursuit had gone to ground. Having no terrier with him, and as the day was closing, he set to work, and with stones stopped the hole as firmly as the circumstances would admit of. Returning early the following morning with his gun and terriers, he found to his mortification that the Otter had scraped a new hole and escaped, while a fresh fall of snow had obliterated its tracks.

Another correspondent informed us that while walking along the bank of a stream in Scotland, he found the unconsumed remains of a Mallard which had been killed and partially eaten by an Otter.*

Mr. F. H. Salvin reports that Otters also kill and eat Rabbits; and this is confirmed by Mr. T. Speedy, who, writing from The Inch, Edinburgh, 17th Dec. 1885, says:—

> "Many years ago, when trapping Rabbits in a hedgerow on the bank of a small, sluggish brook on the Ladykirk estate, I was much annoyed by finding that for several consecutive mornings a number of Rabbits were dragged out of the traps and carried off by some animal. As no traces of either the depredator or the Rabbits were discoverable, I naturally concluded it was the work of some wild animal, but of what sort I could not determine. As there were no fish of any description in the ditch, the idea of Otters never entered my head. Determined to find out the thief, I made an artificial hole in the bank, and set the strongest-springed trap I could find, using a rabbit split up as bait. On the following morning I was not a little surprised to find a large dog Otter secured, which measured 3 ft. 10 in. from point of nose to tip of tail."

---

* For further instances of Otters killing Wildfowl see 'The Field, 31st May, 1873.

As the Otter is amphibious in its habits, it is not unreasonable to suppose that it should feed on rats, voles, and rabbits, more especially when fish are scarce.

Eels are especially liked by Otters, and are easily captured by them. Izaak Walton was of opinion that the Otter can scent them under water, and there appears to be some truth in this. Mr. F. H. Salvin writes, "I know they scent them under water, and bring them up from the mud; indeed, they prefer them to everything." In a subsequent letter he added :—

> "Some years ago, when I found that Otters have the power of scenting under water, I used to amuse myself by sinking a fish on a string with a bullet, and after dragging it some distance, I hid it under a stone. Then I turned in the Otter, which soon hit off the scent, and dived beautifully to the spot and brought up the fish. Then I used to take him out in a boat on a pond, and repeat the same thing in very deep water, where I knew the bait would enter the mud at the bottom ; but the Otter diving *in circles* (as they always do in deep water) never failed to find and bring it up. In order to show how easily they can take eels, and how much they live upon them, I may relate what an Otter of mine once did in the river Wharfe in Yorkshire. At a turn in the river, below Mr. Scott's seat, Woodhall, the water had formed a sand-bank which did not appear above the surface, but could be plainly seen when the water was clear. Upon arriving opposite this place, the Otter dived directly for the sand-bank, and I could see he intended mischief, for his shovel-shaped head was immediately driven well into the mud, and he came up with such a large eel that it lapped round his thick neck.
>
> "As eels can be scented under water in the mud, their capture becomes all the more certain, for they have no chance to escape by swimming."

In addition to the prey already mentioned, Otters are particularly fond of frogs, which they catch at their spawning-places in spring, and at other times in low-lying damp meadows. Mussels also furnish food to Otters. Numbers of their shells have been found in an Otter's haunt with the ends bitten off, and evident marks of teeth upon the broken fragments, the position of the shells indicating that the Otter, after having crunched off one end, had sucked or scooped out the mollusc in much the same way as those who are partial to shrimps dispose of that esculent crustacean.*

---

* Harting, 'Rambles in Search of Shells,' p. 38. The Magellan Sea Otter, *Lutra felina*, habitually preys on a large spiny Crab, *Lithodes antarctica*.—Coppinger, 'Voyage of the Alert,' p. 58.

Mr. H. S. Thomas, in his entertaining volume, 'The Rod in India,' 1873, p. 198, writes:—

"The way the Otter has of taking a bite or two out of a fish and then leaving it to catch a fresh one, and thus destroying many more fish than he needs to devour, though against him in a wild state, is certainly a peculiarity to be taken advantage of in a domesticated one; for a mere snack should suffice him, and he would be game to hunt again at once. The heads might very well be spared to the Otter if the rest be kept by the master."

An Otter has been known to seize a Trout which had been hooked, and to break away with it, line and all.*

In 'The Field' of Nov. 14th, 1885, Mr. R. B. Lee gave an account of a tame Otter dying of distemper contracted from an Otter-hound puppy with which it was being brought up. Commenting upon this in a subsequent number (Nov. 28th, 1885), Mr. S. J. Hurley, of Killaloe, wrote:—

"Some years ago a similar instance came under my observation. At the time I refer to I had an adult female Otter, which by months of care and kindness I had brought to the most perfect state of tameness. She used to live in the house, follow me about like a dog, fish in the widest and deepest part of the Shannon, stay out whole nights together with her wild relations, and in the morning, when all the romping and fishing were over, she would return home and scratch at the hall-door for admittance. To my joy, I discovered that she was in young, and, lest any injury should befall her, I resolved to keep her at home by night, and take her out to fish by day. Just about this time I happened to have two brace of Irish setter puppies down with distemper, and one day, while giving them a little gentle exercise in a field opposite my house, the Otter went into their kennel and lay down in the straw. In a few days she showed unmistakable signs of distemper, being attacked in precisely the same way as the young setters, and, in spite of all I could do, she died. I have had several other tame Otters in my time, the greater number of which I obtained when about a month old. Once I got a brace of young ones scarcely a fortnight old, and, as they were very weak, I put them to a foster mother in the shape of a cat, rearing kittens at the time. The plan succeeded, and I had little trouble in taming them. In June last I procured a brace of baby Otters about a month old, and in less than a week they became perfectly tame, and used to follow me about the roads and fields. Before they were two months old they would go into the river at the bridge here, and come out again to a whistle, or call, like a water spaniel.

---

* 'The Field,' Oct. 16th, 1875.

> "Many people are hard on the Otter on account of its fish-killing propensities, but, from long experience, I maintain that they do comparatively little harm in a mighty river like the Shannon. During the last twenty-five years I have heard of only one instance of a spring or summer Salmon having been killed by Otters. I admit that they will sometimes kill a spawned salmon or well-mended kelt in the winter or spring; but what of that? I have many times seen my Otters fish in parts of the river that were full of salmon and trout, and yet they would be satisfied with an eel."

One of the most remarkable incidents in the life of an Otter occurred in the case of a tame one that learned to hunt one of its own species. Mr. J. Davison, of Andover, has given the following account of it in 'The Field':—

> "One Sunday afternoon, taking a walk down by the Thrum Mill, near Rothbury on the Coquet, to exercise our dogs, on getting to the top of the rocks one of the puppies gave tongue, and out came an Otter with two whelps by her side, making for the river. We got in front, when the mother gained the rocks; but we secured the two whelps. We took them home, and put them with 'Bell,' an otter-hound, who had a litter of three puppies. One of the whelps died, but the other took to the hound, and throve famously; he mixed with the puppies, but fought like a demon, and was soon master of the situation. Wherever they went he went with them, fighting everything that he met with. He also became a pet with all the householders, who never missed a chance of feeding him. His special treat was bowls of milk and broth; to get these he would find his way into dairies, larders, &c. Thus he went on, until we had to enter the puppies for otter-hunting. We had him fastened in a yard with high walls, as we felt sure, if we took him with us, he would join his own species. On our return he bullied and fought the entire kennel of five. About a week after I had to go to Brinkbarn Priory, and took the dogs with me. 'Sandy,' the tame Otter, would go, and into the Coquet they soon got on the lair of an Otter. They swam him through a deep pool, when he took to the bushes. Soon I saw 'Sandy' side by side with 'Rufus,' close to the wild Otter. I said farewell to 'Sandy,' but presently I heard the pleasant sound 'worry, worry.' I thought 'Rufus' had him, but on coming in sight, to my astonishment, 'Sandy' had him fast by the neck, and held him till the dogs came up. From that time he was the leader in all our hunts, and was in at the death of nearly twenty Otters. But, alas! poor Sandy soon came to his end. Love of broth led him into the larder of the Star Inn. The cook, finding him wallowing in the broth, struck him with the wooden ladle—more to frighten than to hurt him; but his skull was fractured, and, after lingering for some days, he died, to the inexpressible regret of all who knew him."

We must reserve for another occasion some remarks on variation, measurements, and weight; and on the much-vexed question of the period of gestation, and the season of reproduction.

(To be continued.)

ON THE VARIATIONS OF THE SMOOTH SNAKE, *CORONELLA AUSTRIACA.*

By G. A. Boulenger.

The first record of the Smooth Snake, *Coronella austriaca*, Laur. (*C. lævis*, Lacép.), as a British species, was published by the late Dr. J. E. Gray in this Journal in 1859 (p. 6730), from a specimen obtained at Bournemouth, and presented to the British Museum by the late Lord Arthur Russell. In the same volume the late Mr. F. Bond (p. 6787) informed the readers of 'The Zoologist' that he had, some years previously, discovered the snake near Ringwood.* There is yet an earlier claim to its discovery in Britain, which must, however, be dismissed as based on an error. A small snake figured by Sowerby (Brit. Miscell. pl. iii. 1804) as *Coluber dumfrisiensis*, and stated to have been caught by a Mr. Simmons near Dumfries, has been regarded as belonging to this species, and the name *C. dumfrisiensis* appears in most of the recent synonymies of *Coronella austriaca*. The specimen has not been preserved, but I am fully convinced that Sowerby's figure is taken from a young bleached specimen of *Coronella doliata*, L., a North American species.†

Since 1859 numerous instances of the occurrence of *Coronella austriaca* in Hampshire and Dorsetshire have been recorded in 'The Zoologist' and 'The Field.' The specimen obtained by Lord Arthur Russell has been figured in Cooke's 'Our Reptiles,' pl. iv., and another figure, accompanied by a most interesting account, has been given by the Rev. O. P. Cambridge in the 'Proceedings of the Dorset Natural History Club' (vii. 1886, p. 84, pl. vi.). But no special attention has as yet been paid to the variations among British specimens.

---

* The Rev. O. P. Cambridge, who accompanied Mr. Bond on that occasion, kindly informs me that the exact spot where the first specimen was caught is near the St. Leonard's public-house, Ringwood Heath, just within the borders of Hampshire.

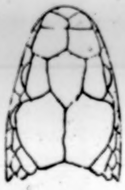
† *Coluber tetragonus*, Latreille, introduced by Fatio in the synonymy of *Coronella austriaca*, I regard as identical with the South African *Homalosoma lutrix*.

One of the most important characters for the distinction of *Coronella austriaca* from its European congener, *C. girondica*, resides in the shape of the rostral shield, the depth of which is much greater in the former, so that a considerable portion of it, forming a triangular area, is bent back on the upper surface of the snout. In the typical *C. austriaca* (of which several specimens from the original locality, *viz.* the environs of Vienna, are in the British Museum), the upper portion of the rostral measures about half its distance from the frontal shield; whilst in the form which predominates in Italy and Sicily, and which has been named *Zacholus fitzingeri*, Bonap., and *Coronella italica*, Fitz., the snout is more pointed, projects more beyond the mouth, and the upper portion of the rostral equals at least two-thirds its distance from the frontal. The difference between extreme specimens of the two forms is very striking, whether the head be examined from above or in profile, and a *C. fitzingeri* is more suggestive of a *Simotes* or *Rhinechis* than of a typical *Coronella*. But there is an almost complete transition between the two extremes, and most recent authors have been content with distinguishing them merely as varieties or subspecies.

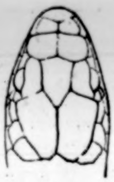
That this form with prominent snout is not confined to Italy was first pointed out by Schreiber (Herp. Eur. p. 308, 1875), who states that he has examined specimens from the Pyrenean Peninsula (no precise locality mentioned) which agree in every respect with the Italian ones. I may add that the only Portuguese specimen I have ever seen, obtained near Coimbra by M. Paulino d'Oliveira, and preserved in the Brussels Museum, belongs to that form; likewise two specimens from N.W. Spain (Corunna and Pontevedra), which I have since received from M. V. L. Seoane. Not long ago Dr. F. Werner (Verh. Zool. Bot. Ges. Wien. xli. 1891, p. 764) recorded the occurrence of individuals of the var. *fitzingeri* near Vienna, and he has been so kind as to send me four for the British Museum. Two of them are particularly remarkable in showing a still greater development of the rostral shield, which reaches the prefrontals, entirely separating the internasals. (See p. 13, fig. *f*).

It is probable that if greater attention were paid to individual variations of this widely-distributed snake, many more new localities for the var. *fitzingeri* would be brought to light. In fact, I am now able to point out its occurrence in England. A small specimen, 330 millim. long, was caught by Master J. L. Monk on August 21st last in Talbot Woods, Bournemouth, and kindly presented by him to the British Museum. In this specimen the rostral is wedged in far between the prefrontals, which form but a very short median suture, and the length of its upper surface exactly equals its distance from the frontal. In the specimen received from Lord Arthur Russell, the upper portion of the rostral measures three-fifths of its distance from the frontal, and in that presented by Mr. Bond one-half; the snout is also more obtuse, and both pertain unquestionably to the typical form. On examining some specimens, three in number, from Hampshire, received from the Zoological Society, I find that they are referable to the var. *fitzingeri;* the upper portion of the rostral in one measures two-thirds its distance from the frontal, whilst in the two others it equals that distance. I must therefore conclude that the character on which *C. fitzingeri* is based, which I may add is not correlative of any other either in the lepidosis or in the coloration, is merely an individual one, more frequent in some localities than in others, but by no means geographically limited, as was hitherto believed to be the case. Prof. Camerano, in his recent Monograph of the Snakes of Italy (Mem. Acc. Torin. xli. 1891), refers all the Italian specimens to his subspecies *fitzingeri*. But a young specimen from Bologna in the British Museum, received from Prof. Bianconi, belongs to the typical form, the upper portion of the rostral being only half as long as its distance from the frontal, and the shape of the snout not differing from that of the form described by Laurenti as *C. austriaca.* I should add that I have considered the question whether the aberrant specimens from Hampshire might not be the result of some importation from southern parts of the Continent; specimens thus brought over for sale in Bournemouth might have been ultimately turned loose in the neighbourhood by their owners and recaptured, as sometimes happens in London, where snakes are occasionally taken in the public parks. I therefore wrote to Mr. A. Green, the well-known naturalist in Bournemouth, to inquire whether any of the snakes he sells were ever received from the Continent. His answer was that he had never imported any Coronellas, and that there is no one else in Bournemouth who deals in Reptiles in any way.

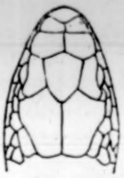
The following figures show the amount of variation in the shape of the snout, and the size of the rostral shield in six specimens :—*a*, *b*, and *f* from Austria; *c* and *e* from Hampshire; and *d* from Piedmont.



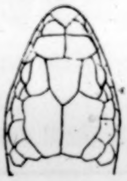
a



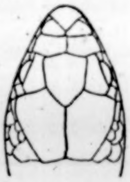
b



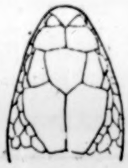
c



d



e



f

The number of scales across the middle of the body is invariably 19. The number of ventral shields varies from 153 to 199; the anal is nearly always divided, but I find it entire in one specimen from Travnik, Bosnia; the number of ventral shields varies from 42 to 70 pairs. The following are the numbers of ventrals and subcaudals in the seven British specimens examined by me :—

♂.	Bournemouth.	A. Russell.	V. 158.	C. 61.
♀.	„	J. L. Monk.	„ 165.	„ 48.
♂.	Ringwood.	F. Bond.	„ 154.	„ 58.
♂.	Hampshire.	F. Beckford.	„ 154.	„ 56.
♂.	„	Zool. Soc.	„ 153.	„ 57.
♂.	„	„	„ 163.	„ 54.
♀.	„	„	„ 177.	„ 55.

In his well-known paper on the scale-pits of snakes (Vidensk. Meddel. 1860, p. 209; German translation in Arch. f. Nat. 1861, p. 127), Reinhardt states that the pits are single in *Coronella austriaca*, and this has even been given as a diagnostic character of the genus *Coronella* by Cope (Proc. Amer. Phil. Soc. xxiii. 1886, p. 487). I have examined a large number of specimens and always find at least a few of the scales with two pits; whilst some specimens may even have most of the scales with two, as, amongst others, the specimen found near Bournemouth by Master Monk.

The Smooth Snake rarely exceeds the length of two feet. The largest specimen in the British Museum measures 28 inches (720 millim.). The startling record of a Danish specimen over 4 ft. long (1280 millim.), by Sarauw (Nat. og Mennesk. Copenh. x. 1893, p. 216), is possibly based on some exotic specimen escaped from confinement, the more so as the number (218) of its ventrals is outside the known range of variation of *C. austriaca.* This species is ovoviviparous, and the young at birth measure 5 to 6 inches.

The upper parts are brown, yellowish, or reddish, often with one or three more or less distinct lighter stripes, and with small dark brown, blackish, or brick-red spots usually arranged in pairs, or forming ill-defined cross-bars; frequently two dark stripes on the nape, usually confluent with a large dark brown or black blotch on the occiput; a dark brown or black streak runs along each side of the head, from the nostril to the angle of the mouth, passing through the eye, sometimes extending along each side of the neck. The belly is often brick-red or orange in the young, usually reddish or purplish brown or lead-grey in the adult, uniform or speckled with blackish or whitish.

A remarkable male specimen (480 millim. long), obtained between Kierling and Weidling, near Vienna, has been sent to me by Dr. Werner. Its snout is remarkably short and broad (see p. 13, fig. *a*), the opposite extreme to the var. *fitzingeri;* the frontal shield is much longer than its distance from the end of the snout. The snake is pale brown above, with four blackish parallel fine lines along the anterior fourth of the body, the median pair enclosing large reddish brown black-edged spots forming more or less regular bars, these markings producing the ladder-pattern well known in the half-grown *Rhinechis scalaris.* The belly is red dotted with black, the lower surface of the tail with a black spot in the middle of each subcaudal shield. The specimen is further remarkable in having two small yellowish, dark-edged spots close together on the back of the head, separated by the suture between the parietal shields.

The only notice of melanism in *Coronella austriaca* is to be found in an appendix to Mr. Cambridge's paper (Proc. Dorset Nat. Hist. Club, vol. vii. p. 91), where Mr. William Penney, of Poole, is stated to have found near that place two specimens of a black variety.

ON THE PARTIAL ASSUMPTION BY FEMALE BIRDS OF MALE PLUMAGE.

By J. H. Gurney, F.L.S., F.Z.S.

This is an interesting subject, and one which has engaged the attention of such naturalists as John Hunter, Darwin, and Yarrell, whose paper read before the Royal Society is classical.* In the last number of 'The Zoologist' (1893, p. 458), Mr. Coburn has referred to the case of a female Merganser, *Mergus serrator*, assuming male plumage. A similar case came under the notice of my late father. He proved by dissection that a supposed young male Merganser, showing a considerable amount of black plumage about the head and neck, was a female. Such cases as these indicate that the change is not a result of semi-domestication, although the likelihood of the metamorphosis is increased by domestication, as demonstrated in the cases of the hen, duck, and pheasant.

It would be interesting to ascertain what species among the *Anatidæ* have exhibited this abnormal tendency. Four may be named:—the Mallard, *Anas boschas*, the Wigeon, *A. penelope*, the Tufted Duck, *Fuligula cristata*, and the Scaup, *F. marila*. The Rev. H. A. Macpherson, in his 'Study of British Birds' (pp. 71, 72), is my authority for the Tufted Duck, and the late Edward Blyth for the Scaup. The normal adult plumage of a female Scaup is a white face and brown head and neck turning sooty black (A. C. Chapman, Zool. 1887, p. 8). The female bird figured in Dresser's 'Birds of Europe' is not adult.

The late Mr. Cecil Smith remarked this masculine change in a female Wigeon ('Ibis,' 1888, p. 228), and it has been noted not unfrequently in the ordinary Wild Duck, *A. boschas*, in England, with one exception (Birds of Northumb. and Durh.,

---

* Phil. Trans. 1827, p. 268—275. See also a paper by him on the assumption of the male plumage by the female of the common Game-fowl, Proc. Zool. Soc. 1831, p. 22.

p. 152), always in a domesticated state. These ducks sometimes live to a great age. My father had one which was believed to be twenty-nine years old, and I have another, in perfect male attire, believed to be now ten years old: this is the same bird which a decoy-drake treated as a veritable male and bullied, while his own mate looked placidly on. The Tufted Duck mentioned by Mr. Macpherson was twelve years old.

In passing, it may be remarked a ready way which may be adopted of acertaining the sex of Mergansers, which I have tried in Leadenhall Market, is by passing the finger and thumb down the neck and feeling for the enlargement of the trachea. But such a test would be of no avail in the Wigeon and Tufted Ducks.

Mr. Coburn does not state that the ovary of the Merganser examined by him was diseased, and in my father's specimen there was no sign of disease, so probably they were both healthy birds. The diseased condition of the ovary which is sometimes presented in a hen Pheasant may be seen in Yarrell's illustration on page 103 of vol. iii. of his 'British Birds.' Yarrell, it will be remembered, was of opinion that disease always accompanied the change of plumage; but birds may recover from disease with or without any resumption of the normal colour; a hen Pheasant of this description, which was caged by my father, recovered its ordinary female plumage. Again, there may be a diseased condition of the ovaries without any indication of it by a change of plumage.

It would be interesting to know whether, after this change of plumage, the *Anatidæ* are capable of laying fertile eggs. Gallinaceous birds almost always become barren, but apparently some Passerine birds do not, such as Redstarts and Red-backed Shrikes, though there does not appear to be any ascertained cases of their having reared young.

There is a recorded instance, and only one, so far as I am aware, of a domestic hen in cock's plumage producing young. This is mentioned in 'The Field' of Nov. 1st, 1884. This seems to be the only incontestable instance of any female bird in male plumage having young ones—or perhaps I should say recorded instance of what may occasionally happen and nevertheless escape notice.

I have seen certainly four, if not five, female Redstarts assuming male plumage, but none of them had completed the change. Blyth wrote that he had detected similar examples by their smaller size ('Field,' June 17th, 1871), adding that the feathers are overlaid with dingy tips, as in newly-moulted males in autumn. But those which I examined wanted the freshness of colour of a young male Redstart or a newly-moulted adult, and though they laid eggs there is no evidence that the eggs were fertile.

In 1886 I exhibited a series of Redstarts to the Norwich Naturalists' Society, including one of those anomalous females, and described its plumage. The most noticeable feature about it was the throat, which had not the pretty mottling of a young male, neither had it the pure black of an old male; its hue was grey, a little darker than the back of an ordinary adult male Redstart. The white forehead was slightly shown, but the breast, though much redder than a female's, had not half the depth of colour of an adult male's.

In 'The Ibis,' 1888 (p. 229), a list is given of twenty-four species of birds, in which one or more instances of a female assuming male plumage are recorded. To make it complete the following should be added, making thirty-three species, referable to five families, or thirty-five if the Woodchat and Golden Oriole are included: of these seven have been figured, but no Passerine bird among them, which is to be regretted, as the transformation is characteristic in *Ruticilla* and *Lanius*:—Montagu's Harrier ('Ibis,' 1875, p. 222); Bearded Titmouse ('Field,' Sept. 14, 1872); Cirl Bunting (Bull. Soc. Zool. France, ii. p. 23); Black-headed Bunting, *E. melanocephala* (ditto); Crossbill ('Naturalist,' 1889, p. 52); *Pyranga æstiva* (Audubon, Orn. Biog. v. p. 518); Summer Tanager ('The Auk,' 1891, p. 315); Macaw ('Gentleman's Magazine,' 1785, pp. 782, 959); and Tufted Duck (Macpherson, Brit. Birds, pp. 71, 72).

There is no bird which demonstrates this metamorphosis so often as the Common Pheasant, as sportsmen know well. It is pretty frequent in the Capercaillie, and Black Grouse also, though more so in the former, according to Mr. Millais ('Game Birds,' p. 40), and examples occasionally turn up in Leadenhall Market, but in the Pheasant it is very common. While making these notes (Dec. 13th) I shot one, and saw another the previous week; a quick eye can detect them even when running about.

Mr. Gunn, of Norwich, among the many which have passed through his hands, has never seen one so perfect that it could not be distinguished from a cock. Neither have I, save in the single instance of the one mentioned in the 'Transactions of the Norfolk and Norwich Naturalists' Society' (iv. p. 184), and that was a perfect plumaged cock Pheasant without spurs; but the sex may not have been, and probably was not, ascertained with certainty. Nevertheless, if a female Duck and a Chaffinch can attain the perfect masculine garb, why not a Pheasant?

Mr. Gunn has one which comes very near to perfection, but the black chest-spots and breast-markings are smaller, and the tail not so long as that of the cock.

In Mr. Millais' beautiful 'Game Birds,' already referred to, there is a plate of an adult Black cock assuming the plumage of the Grey hen. A similar instance is given of a Barn-door cock figured in Mr. Tegetmeier's 'Poultry Book' (p. 133). Such cases, however, are of extreme rarity.

NOTES AND QUERIES.

BIRDS.

The Migration of Partridges.—In 'The Zoologist' (1893, p. 433) a correspondent enquires whether Partridges are known to migrate, from which I conclude that the occurrence of the so-called "Zughühner" (*i. e.* "wandering partridges") in North Germany is not so generally known in England as in Germany, where almost every educated forester and hunter has at least heard of it. It may therefore be of interest to the readers of 'The Zoologist' to supply a few notes on the subject. In the northern parts of Germany large flocks of Partridges were noticed by a number of observers to appear suddenly in autumn or winter, and to disappear again before the breeding season. They were also seen in packs of from fifty to at least five hundred, always kept close together, and could not be dispersed. They strayed restlessly over the fields, were extremely shy, and were difficult to shoot. These wandering Partridges are said to be distinctly smaller, greyer than the common German Partridge, and to have darker feet. I met with such Partridges once. When shooting with my father in the long lyme-grass, *Elymus arenarius*, behind the sand-dunes on the Baltic in East Prussia, and following some single Partridges, we saw, to our surprise, more than two or three hundred birds get up some hundred yards in front of us. Being by ourselves we tried to follow them, but they were so shy that we could not get a single shot, and they were soon out of sight and never seen again. I know of others who were fortunate enough to procure one or two of such birds, but I have never examined a specimen myself. The "Zughühner" apparently belong to a different race, and must not be confounded with the well-known large grey Russian bird which is brought to the London market in enormous quantities. Naumann, the great German ornithologist, wrote:—"Partridges are stationary birds, straying about under certain circumstances only. The majority never leave the neighbourhood of the place where they are hatched, though exceptionally, if much disturbed and short of food, they will stray away for a time, but to a short distance only, returning as soon as circumstances are more favourable. In North Germany, however, by the end of October or in November, foreign Partridges appear, coming apparently from northern countries, and driven from their home by severe weather, cold, and want of food, to seek this and shelter in our comparatively milder climate. Sometimes they do not forsake our fields before the early spring. These Partridges, called "Zughühner" by German sportsmen, seem to be smaller than ours, perhaps because they are natives of a more barren country. They do not differ, however, in colour and markings, except in the slightly darker colour of the feet, and there is no difference in their note and habits, except that they keep together in immense packs and that they are exceptionally shy. They often appear in parts of the country where there were no Partridges before, and in flocks of from fifty to a hundred. One of my brothers once saw a pack of perhaps five hundred wandering along very hurriedly, half on the wing, half running, in a direction from east to west, and covering a narrow track for a distance of perhaps three hundred yards. They were constantly moving onward, all in the same direction, those in the rear flying over those in front, and so quickly that all disappeared out of sight within a few minutes." Naumann then details his reasons for not considering these Partridges to be of a distinct species. A comparison, nevertheless, of a number of specimens of these migratory birds would be very desirable at the present day, when the study of local forms is far more advanced than it was sixty years ago, when Naumann wrote the sixth volume of his immortal work.—Ernst Hartert (Zoological Museum, Tring).

[Some pertinent remarks on this subject have lately been published by Mr. H. A. Macpherson in a volume on the Partridge issued by Messrs. Longman in their so-called "Fur and Feather" series. Of this volume we hope shortly to give a notice.—Ed.]

Lapland Bunting at Flamborough.—Mr. Matthew Bailey having sent word that he had several times seen a flock of from sixty to eighty Lapland Buntings near Flamborough village in the second and third weeks in November, on the 21st of that month, when staying at Flamborough, I accompanied him to the spot, and after a little search found them on a barley stubble. This field, which had all the appearance of bad cultivation, was much frequented by small birds for the sake of the various seeds of weeds to be found there. There was a flock of about one thousand Snow Buntings, besides droves of the common Sparrow, Chaffinches, Greenfinches, and others. It is surrounded by rough unkept hedges. The Lapland Buntings, like the other birds, were on the stubbles, but flew up in rather close a body to the hedge, and then began directly to drop by twos and threes to the stubble. On our moving a few steps they again took to the hedgerow, and this sort of thing was repeated while we remained. I should say that Mr. Bailey's estimate of sixty to eighty was very near the number we saw then, although on subsequently visiting the place later in the day I calculated the flock at one hundred to one hundred and twenty. When on the hedge they were very favourably placed for examination through the glass. Like Snow Buntings, they show considerable diversity of plumage. The flock was a mixed one, males and females, and probably also young; the males had the black parts much broken and mottled, and amongst them were several Linnets and three very bright Siskins. In their flights between the stubble and hedge the grey markings on the wings and outer tail-feathers afforded a very distinguishable feature, and they appeared to me to spread their tails considerably more than do some small birds, recalling in this respect the flight of the Crested Lark, which I have seen in Germany. They might easily be passed over for Tree Sparrows, having exactly the same habit of crowding a hedgetop and straggling down to the stubble to feed, and on the least disturbance all flying up in a body. Mr. Bailey told me that on one occasion, on the road between Flamborough village and the lighthouse, the whole flock dropped from the hedge to the footpath about twenty yards before him. During the day I saw two or three with Snow Buntings about a shallow pool in a field, one of these being on the floating weed. I also saw, on Nov. 22nd, a "Leaf-warbler" like a Chiffchaff on the side of a plantation hawking for flies.* It is a curious fact that during the hurricane from the north on the 19th, several Terns were seen near the extreme point of the headland. Immense flights of Snow Buntings came in at Flamborough in the same week as the Lapland Buntings, and I saw many large flocks on the stubbles there during my visit.—John Cordeaux (Great Cotes, R.S.O., Lincoln).

Little Auk in Co. Sligo.—When walking on the Enniscrone Sands, on Nov. 19th, I picked up the remains of a Little Auk, *Mergulus alle*, destroyed by the Gulls. It was in a perfectly fresh state, however, and had evidently come ashore but a few hours previously. Along the same sands I also found several Puffins, Razorbills, and Guillemots, all driven ashore by the N.W. gale of the two previous days.—ROBERT WARREN (Moyview, Ballina).

---

* This was not a Chiffchaff; it had a distinct bar on the wing.

Storm-driven Sea Birds.—After the terribly destructive gales of Nov. 19th and 20th, a Storm Petrel was picked up at Livermere, near Bury St. Edmunds, and an adult Puffin within the limits of the borough, which is nearly forty miles from the sea. The latter bird was alive and well when found, and was taken to Mr. Travis, the Bury taxidermist, who kept it alive for a week, but it refused to touch either fish or flesh. The Puffin is a far more uncommon bird in Suffolk than the Little Auk; the late Mr. N. F. Hele, in his 'Notes about Aldeburgh,' was only able to record the occurrence of three specimens in about thirty years. Mr. Travis had at the same time another adult Puffin from March, in Cambridgeshire, which I purchased in the flesh, and this bird had evidently met its death by flying against some obstacle, the contact with which had fractured the skull. A local paper records the fact that two days after the gale "more than twenty sea-birds were picked up on the warrens near Icklingham and Mildenhall, driven in by the terrific storm of Nov. 18th. There were amongst them Guillemots, Razorbills, Puffins and Little Auks. Mr. Howlett, of Newmarket, had no less than thirty brought to him, some of them alive." —JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Uncommon Birds in Somersetshire.—About the end of last November one or two uncommon birds were shot near Bridgwater, amongst others a Peregrine Falcon, a Grey Phalarope, and an immature Pomatorhine Skua, *Stercorarius pomatorhinus*. The last named was brought to me, in the flesh, for identification, and, as far as I know, it is the first reported occurrence of this bird in Somerset. On Nov. 3rd a Guillemot was shot in the river close to the town, just opposite a brick-yard, an unusual time of year at which to find this bird here. All these are in the collection of Mr. C. W. H. Tucker.—H. ST. B. GOLDSMITH (King Sq., Bridgwater).

[The Pomatorhine Skua, though not included by the late Mr. Cecil Smith in his 'Birds of Somersetshire,' has been several times met with in this county. See the Rev. M. A. Mathew's 'Revised List of the Birds of Somerset' in Proc. Somerset Archæol. & Nat. Hist. Soc. 1893.—ED.]

Great Grey Shrike in Worcestershire. — On the 28th November last an unusually large specimen of the Grey Shrike, *Lanius excubitor*, was shot at Brandwood End, King's Heath, Worcestershire. It had but one white wing-spot, was delicately vermiculated on the breast, and measured ten inches and three-sixteenths in length. Mr. H. E. Dresser, who examined the bird, said that it was *L. excubitor*, and of the variety known as *L. major*, though not the true *L. major*.—F. COBURN (Holloway Head, Birmingham).

Cuckoo chased by a Rook.—At Midhurst last summer a Rook was seen chasing a Cuckoo, and shortly after a Cuckoo was picked up dead. When skinned and dissected it was found to have died from a clot of blood on the heart, evidently the result of fright and the speed at which it was forced to fly. The bird is now in my collection. Can any one tell me why the Rook should have been antagonistic to the Cuckoo?—J. N. SMITH (30, Shooter's Hill Road, Blackheath).

[The Cuckoo is frequently chased by other birds, apparently mistaken for a hawk, the common enemy to their race.—ED.]

Great Shearwater in Killala Bay, Co. Mayo.—On the 23rd April last, whilst standing on the end of the pier at Enniscrone watching a play of Gulls, I was surprised to see a flock of eleven Shearwaters beating about amidst the crowd of Gulls and Guillemots. Their mode of fishing was very peculiar, and quite different from that of the other birds; for, while in full flight close along the surface of the water, and without the slightest pause, they would suddenly dash into the water with a splash, and disappear beneath the surface for some moments, reappearing again some yards further on. This mode of fishing they continued while beating to and fro over the spot where the fish were, like sporting dogs quartering a field for game. I had a very good though distant view of them through my glass, and from their much larger size than the Manx, and from not displaying the pure black and white plumage of that bird, I have no doubt of their being the Great Shearwater, *Puffinus major.* None of those that I saw were dark enough underneath for the Sooty Shearwater, *P. griseus.* I continued to watch them for an hour, and regretted that, being Sunday, I was unable to obtain a gun and boat and go in pursuit of the flock. I have never before known this species to appear on our coast in April. Is it probable that a few pairs may breed on some remote part of the Irish coast? No doubt there are many islands and island rocks that have never been visited by competent naturalists.—ROBERT WARREN (Moyview, Ballina, Co. Mayo).

"Blood-Olph," a name for the Bullfinch.—'The Zoologist' for December contains a review of Prof. Newton's 'Dictionary of Birds,' in which the following passage occurs:—"It is stated that 'Blood-Olph' is a not uncommon name for this bird (the Bullfinch); but we have never met with it, though we have been in almost every county in England." It may be worth pointing out that the name, spelt as "Bloodolf," occurs in a list of local names in use in Norfolk, contributed by the late Mr. J. H. Gurney to 'The Zoologist' for 1878 (p. 288), and in the first volume of the 'Birds of Norfolk' (p. 234), Mr. Stevenson writes:—"The provincial name of 'Blood Olph' is commonly applied to the Bullfinch in Norfolk, in the same way that 'Green Olph' is used to denote the Greenfinch, as before stated." It is hardly necessary to add that the name is derived from the carmine-red of the breast of the male Bullfinch, and I venture to say that if one of these birds were exhibited in any village school in Norfolk or Suffolk, it would be recognised as a "Blood-Olph." A friend, who has for many years taken much interest in the Suffolk dialect, has appealed in vain in the local press for information as to the origin of the name "Olph." Montagu and St. John, in their respective works on British Birds, give the name "Alp," the latter adding in his index, "Bloodulf, a name for the Bullfinch." It may be of interest to add that in May last I had a nest of the Bullfinch brought me, with three eggs of the Bullfinch and one of the Cuckoo, which I believe to be thoroughly genuine.—JULIAN G. TUCK (Tostock Rectory, Bury St. Edmunds).

Ring Dove pairing with Domestic Pigeon.—During the past summer a Ring Dove, *Columba palumbus*, paired with a House Pigeon at Rusland, and two, if not three, clutches of eggs were laid during the course of the summer in the buildings. Though both the parent birds attended zealously to the task of incubation, I am sorry to say the eggs proved unfertile. The birds were much attached to each other, and the tame bird seemed proud of the alliance. The cushat, a hen bird, was quite tame, and fed fearlessly on the lawn and in the yard.—CHARLES F. ARCHIBALD (Rusland Hall, Ulverston).

[Several cases are on record of the Wood Pigeon breeding in captivity, but instances of its interbreeding or pairing with other species are rare. In 'The Field' of July 22nd, 1876, Mr. Tomalin, of Northampton, reported that a male Stock Dove paired with a hen Wood Pigeon in his aviary, and two eggs were laid, but were unfortunately broken, having been evidently pecked by one of the birds. The late Mr. Robert Gray, of Glasgow, several times succeeded in rearing young Wood Pigeons from eggs placed under a House Pigeon, but in only one instance did he know of a Wood Pigeon breeding in captivity. This was a hen bird which was taken young and restored to liberty when full grown; but instead of flying away she paired with a House Pigeon in a dovecote at Cummock. The pair had eggs three times, but only one young bird was reared. This was larger than the domestic Pigeon, and resembled the female parent in its general markings.—ED.]

Swimming Powers of the Water Ouzel.—The question has often been asked whether the Water Ouzel can swim. I have myself, in the course of an experience of nearly half a century as a fisherman, very often seen this bird dip into shallow water running quickly over gravel, and disappear for a short time. I believe that it can run on the bottom. But on the 19th October last I was fishing for salmon in the River Usk at Llanguttor, Monmouthshire, in a part where the stream was wide, very strong, and certainly five feet deep. I was accompanied by a friend, Mr. C. W. Walker, of Pontrilas. We saw a Water Ouzel fly into the middle of the stream, settle there, dive more than once, like a Dabchick, and when we got quite near to the place, rise from the water and fly away. There was no question what the bird was. How it accomplished these feats is more than I can say, but that it did so I am a witness.—B. St. John Attwood Matthews (Pontrilas Court, Hereford).

[We have repeatedly seen the same thing when fishing in Northumberland and in North Wales, and supposed it well known to all observant anglers on streams where the Dipper is common. It has a pretty habit of alighting on the water, or entering it from a stone in mid-stream, and allowing itself to be carried down by the current. You see what appears to be a little ball of white foam approaching you, and when within a few yards it turns out to be the white breast of a Dipper, which suddenly rises and flies away.—Ed.]

White Wagtail in Worcestershire.—On the 6th May last I shot a White Wagtail, *Motacilla alba*, at Brandwood End, King's Heath; and on the 13th April another was shot within a few miles of Brandwood End. These are the first I have on record for Worcestershire. I saw another, but did not interfere with it. I watched it almost daily until the end of June.—F. Coburn (Holloway Head, Birmingham).

Nesting of the Sparrowhawk.—Having for some years particularly noted the materials used by this bird in nesting, I have found that three-fourths consisted not only of the usual twigs and sticks, but also of a quantity of small pieces of bark, on which the eggs are laid—not necessarily the bark of the tree in which the nest is built, for, in one case that came under my notice, a Sparrowhawk repaired the old nest of a Carrion Crow that had wintered many a year in the top of a large holly tree, with the bark of both fir and oak for lining. I have found Sparrowhawks not only utilising nests of the Carrion Crow in several instances, but returning to old nests of their own species after a lapse of one or more years, these nests having in the meantime been occupied by Long-eared Owls. In the majority of cases, however, they seem to build entirely fresh nests.—J. S. Elliott (Dixon's Green, Dudley).

Waxwing in Worcestershire.—A portion of the flock of Waxwings, *Ampelis garrula*, which visited us last winter, made their way to the Lickey Hills, Burnt Green, Worcestershire. A solitary specimen was picked up dead at the foot of Rednall Hill, and brought to me on the 23rd February last. I saw a Waxwing fly from some trees on the banks of the River Mawddach, near Barmouth, North Wales, on the 28th December, 1892.—F. Coburn (7, Holloway Head, Birmingham).

Cats catching Butterflies and Moths.—May I ask if you have known many cases of a cat catching butterflies and eating them? I was staying in Devonshire last summer at a house where there was a large quantity of over-ripe fruit on the ground. "Red Admirals" were in numbers also, settling on the pears and apples as they lay broken open by their fall, or eaten away by wasps, &c. I repeatedly saw a cat stalk and catch these "Red Admirals" in her paws, play with them like a mouse, and eventually chew them to a shapeless mass. I never saw her miss catching one, and she invariably touched them so lightly that they fluttered about a good bit when she was playing with them.—J. A. Bucknill (Hylands, Epsom).

[We do not remember to have seen a cat catch butterflies, for, as a rule, they fly too high; but we have repeatedly seen one catch small moths upon the lawn on a summer evening and devour them with apparent relish. On one occasion we saw this cat with her paw knock down a Long-eared Bat which was skimming low along the ground in pursuit of the same moths.—Ed.]

Notes from Epsom.—It may be of interest to record the breeding of the following birds near Epsom, only some sixteen miles from the middle of London:—Green Woodpecker, Grasshopper Warbler, Common Snipe, Bullfinch, Nightjar, and Dabchick. The Lesser Whitethroat has built freely all over the common, and a pied Rook has frequented the fields for some weeks. This bird seems to feed at some distance from and usually at a different time to the others. The Kingfisher has nested both this and last year on the Mole near Cobham, as well as the Mallard; I have seen as many as four of the former together.—J. A. Bucknill (Hylands, Epsom).

Leach's Petrel on the Sussex Coast.—You might like to record in 'The Zoologist' that we have received three specimens of Leach's Petrel during the late gales—one picked up at Arundel, another shot at Southwick by Capt. Curtis, and a third caught alive on the beach near the Brighton Aquarium on Dec. 9th, which lived until the following day. They were all extremely thin and light. The two last mentioned were males, the first-named a female. We have also received lately a handsome specimen of the Little Gull, *Larus minutus*, in immature plumage, sent to us for preservation by Capt. Curtis, of Southwick, who shot it there during the gale on Dec. 13th.—Pratt & Sons (11, North Street Quadrant, Brighton).

REPTILES.

An Assembly of Vipers.—On a sunny bank in a wood near here, my gamekeeper came suddenly upon a bunch of full-grown Vipers, all intertwined. Having his gun with him, he fired a charge of shot into their midst, and this had the effect of disabling eight, which were afterwards killed with successive shots, and scattering others, which made their escape. I take it to be a rare occurrence for so many adult Vipers to be found in company.—J. C. Mansel Pleydell (Whatcombe, Blandford, Dorset).

SCIENTIFIC SOCIETIES.

Linnean Society of London.

November 16*th*, 1893.—Prof. Stewart, President, in the chair.

Messrs. R. Assheton, H. N. Bernard, and W. H. Wilkinson were admitted Fellows.

Mr. J. H. Veitch exhibited a large and interesting collection of economic and other vegetable products of Japan, recently brought by him from that country, and described the various uses to which different kinds of wood, fibre, grass, &c., were applied for domestic purposes, as also the way in which various sea-weeds were collected and prepared for food. As the vegetable product was in every case labelled with the scientific name of the plant from which it was prepared, the series was a most instructive one, and a hearty vote of thanks was accorded to the exhibitor.

Mr. A. G. Renshaw exhibited a remarkably large specimen of the Giant Puffball, *Lycopodium giganteum*, which he had gathered at Catford Bridge, and which was considered to be above the average dimensions.

On behalf of the Rev. Prebendary Gordon, M.A., the Secretary exhibited a plant of *Veronica salicifolia* of New Zealand, found growing in Langland's Bay, Mumbles, Swansea, the seeds perhaps having been introduced in ballast from some homeward-bound ship.

A paper was then read by the Rev. G. Henslow, M.A., "On the Origin of Plant-structures by self-adaptation to the environment, exemplified by desert and xerophilous plants." The purport of this paper was to prove by a direct appeal to facts the probably universal application of Mr. Darwin's assertions, *viz.* (1) that Natural Selection has no relation whatever to the primary cause of any modification of structure ('Animals and Plants,' &c., vol. ii. p. 272); (2) that modifications of structure are due to the direct action of the environment (*fide* Darwin, Weismann, Spencer, &c.); this always results in "definite variations," by which Mr. Darwin signifies (3) that all, or nearly all, the individuals became modified in the same way ('Origin of Species,' 6th ed. p. 106); and consequently (4) that "a new variety would be produced without the aid of natural selection" ('Animals and Plants,' ii. 271; 'Origin of Species,' pp. 72, 175). Mr. Henslow showed (1) that all the species constituting the peculiar *facies* of a desert flora are the direct result of their climatic conditions; (2) that these peculiarities are in nearly all cases of the utmost benefit to the plants, such as the hardening of the tissues, the reduction of parenchyma, the minute size of the leaves, the dense clothing of hair, a thick cuticle, the presence of wax, storage of water tissues, &c.; but (3) these features are just those which systematists utilise as descriptive characters of varieties and species. Mr. Henslow observed that by Darwin's assuming that "indefinite variations" which are characteristic of *cultivation* were equally so in *nature*, he reasonably requires natural selection to correspond with artificial selection, but that assumption he believed to be erroneous. For experiments proved that by sowing seeds in a very different medium, *all* the seedlings vary in the same direction, *viz.* that of adaptation to the new environment, verifying Mr. Herbert Spencer's statement that "under new conditions the organism immediately begins to undergo certain changes in structure, fitting it for its new conditions." The conclusion is thus arrived at which is expressed in the title of this paper. The functions of natural selection therefore become limited as follows:—(1) The survival of the constitutionally strongest amongst seedlings. (2) Delimitation of species by the non-reproduction of intermediate forms. (3) The geographical distribution of plants by self-adaptation. An interesting discussion followed in which Prof. Reynolds Green, the Rev. Dr. Klein, Mr. Perry Coste, and others took part.

December 7th.—Prof. STEWART, President, in the chair.

Mr. A. Trevor Battye was admitted a Fellow of the Society, and the following were elected:—Messrs. J. H. Cooke, H. Cummins, R. E. Leach, C. Sharp, A. Smith, F. C. Smith, A. H. Teague, and H. L. Thompson.

Mr. C. T. Druery exhibited and made remarks upon a new example of apospory in *Scolopendrium vulgare*, and Prof. Bower brought forward a similar case in *Trichomanes Kaulfussii*.

Mr. George Brebner exhibited some new and rare British Algæ, including *Haplospora globosa*, *Tilopteris mertensii*, *Ectocarpus tomentosoides*, and *Polysiphonia spinulosa* v. *major*.

Mr. F. Enoch, with the aid of the oxyhydrogen lantern, exhibited the various stages of development of the black-currant mite, *Phytopus ribis*, and gave an interesting account of its life-history.

Mr. Thomas Christy exhibited a gigantic reed from the Zambesi, with drawings of sections. It appeared to be allied to *Sanseviera cylindrica*, but differed conspicuously in the greater size of the leaves, which measured nine feet in length, instead of from eighteen inches to three feet. The remarkably tough and strong fibre which it produces is considered to be of great commercial value, being equal to the best Sanseviera hemp.

Mr. W. F. Kirby read a paper on the Dragonflies of Ceylon, with descriptions of some new species. The paper was based chiefly upon a collection made by Col. Yerbury, which he had presented to the British Museum. Seventy-five species were enumerated, of which fifty-five had been collected by Col. Yerbury. Another collection, made in Ceylon by Mr. E. Green, had been dealt with in a previous paper (Proc. Zool. Soc. 1891, pp. 203—206).

On behalf of Signor Martelli, the Secretary read a paper "On the cause of the fall of the corolla in *Verbascum*," which gave rise to an interesting discussion.

Zoological Society of London.

November 21*st*, 1893.—Sir W. H. Flower, K.C.B., LL.D., F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of October, 1893, and called special attention to an example of the Goliath Beetle, *Goliathus druryi*, the largest of known Coleoptera, obtained near Accra, and presented October 5th by Mr. F. W. Marshal; and to an adult female and a young of the Manatee, *Manatus americanus*, captured in Manatee Bay, Jamaica, and most kindly sent home for the Society's Collection by Sir Henry A. Blake, K.C.M.G. Unfortunately the Manatees had reached the Gardens in a very exhausted condition, and died soon after their arrival.

The Secretary read an extract from a letter addressed to him by Mr. J. S. Mackay, of the Kangra District, Punjaub, relating to a young Snow-Leopard which he had in captivity, and exhibited some photographs of this animal.

Mr. Sclater exhibited and made remarks on a mounted specimen of an African Monkey, *Cercopithecus albogularis*, belonging to the Leyden Museum.

Mr. W. B. Tegetmeier exhibited and made remarks on two hybrid Pheasants, believed to be crosses between the Common Pheasant and the Gold and Silver Pheasants.

A communication was read from Messrs. G. W. and E. C. Peckham, on the Spiders of the family *Attidæ* of the Island of St. Vincent, based on specimens collected in that island by the agency of the joint Committee of the Royal Society and the British Association for the exploration of the Lesser Antilles. The series had been collected by Mr. Herbert H. Smith and Mrs. Smith, who had been specially sent to the island as skilled collectors by Mr. F. D. Godman.

A communication was read from Mr. P. R. Uhler, containing a list of the Hemiptera-Heteroptera collected in the Island of St. Vincent by Mr. and Mrs. Herbert H. Smith, with descriptions of new genera and species.

Dr. G. Lindsay Johnson made some observations on the refraction and vision of the eye of the Common Seal, *Phoca vitulina*.

Mr. Sclater read a paper on some specimens of mammals from Lake Mweru, British Central Africa, transmitted by Vice-Consul Alfred Sharpe, through Mr. H. H. Johnston. The specimens were referred to seventeen species, amongst which was a new Monkey of the genus *Cercopithecus*, proposed to be called *C. opisthostictus*, and a new Antelope allied to the Waterbuck, which was named *Cobus crawshayi*, after Mr. R. Crawshay, who had first discovered the species.

December 5th.—W. T. Blanford, F.R.S., F.Z.S., Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of November, 1893. Among these special attention was called to a Cunning Bassaris, *Bassaris astuta*, obtained by purchase; to two Jerboas presented by Capt. R. A. Ogilby; and to a fine adult female of the Caucasian Wild Goat, *Capra caucasica*, presented by Mr. H. P. Deasy.

Prof. G. B. Howes exhibited and made remarks on some specimens of abnormal Marsipobranch Fishes. These were two heads of the Lamprey with the first pair of gills only imperfectly developed, and a Hag, *Myxine glutinosa*, with a supernumerary gill on one side.

Mr. F. E. Beddard gave an account of the general geographical distribution of Earthworms, as treated of in a work on the subject which he had in preparation. Mr. Beddard recognized 69 genera of this order, divided into six families; and after some preliminary remarks on the artificial introduction of Earthworms into districts colonized from Europe, called attention to a series of tables in which the genera found in the six generally recognized regions of the earth's surface were shown. In addition to these six regions Mr. Beddard was disposed to recognize, in the case of Earthworms, the existence of an Antarctic Region, to embrace New Zealand and most of the Antarctic Islands.

A communication was read from Mr. C. J. Gahan, containing an account of a collection of Coleoptera sent by Mr. H. H. Johnston, from British Central Africa. Amongst these were examples of eight species new to science.

A communication was read from Capt. F. W. Hutton, containing a report on a collection of Petrels from the Kermadec Islands. Amongst these was an example of a new species proposed to be called *Œstrelata leucophrys*.

Mr. G. A. Boulenger gave an account of *Vipera renardi*, a newly-recognized European Viper from Southern Russia and Turkestan.—P. L. Sclater, *Secretary*.

Entomological Society of London.

December 6th, 1893.—Henry John Elwes, Esq., F.L.S., President, in the chair.

Mr. W. F. Kirby exhibited, for Dr. Livett, a series of specimens of a moth taken at Wells, which Dr. Livett considered to be varieties of *Dasycampa rubiginea*, but which many entomologists present thought were varieties of *Cerastis vaccinii*. Mr. Kirby added that specimens similar in appearance to those exhibited had been taken rather freely during the past autumn in Berkshire, and it was suggested that they might be hybrids between *D. rubiginea* and *C. vaccinii*.

Mr. Lovell Keays exhibited a series of *Lycæna alexis*, with confluent spots on the under sides of the front wings. He drew attention to the fact that the insects were all taken within a short radius, and probably were in the ratio of about one in forty with reference to the ordinary forms. All the examples, with one exception, were females.

Mr. C. O. Waterhouse exhibited the type-specimen of *Coptomia opalina* of Gory, from the Hope Collection at Oxford, and pointed out that it was quite distinct from *C. mutabilis*, W. The distinct punctuation of the whole insect, and the striolate pygidium in *C. opalina*, were sufficient to distinguish it at once. Mr. Waterhouse called attention to this, as some French entomologists maintain that these insects are the same species. He also called attention to *Silpha atomaria*, of Linnæus (Syst. Nat., ed. xii., i., p. 574), a Swedish species which appeared to have escaped notice, and was not included in any catalogue. The type is still extant in the Linnean cabinet, and Mr. Waterhouse said he was of opinion that it is *Olibrus geminus* of our collections, but he had not had an opportunity of making a critical examination. He also exhibited male and female specimens of a *Helopeltis* (the Tea-Bug), which he considered a distinct species, and stated that it had occurred only in Assam.

Mr. M. Jacoby exhibited certain species and varieties of the genus *Ceroglossus* from Chili, and Dr. D. Sharp, Mr. J. J. Walker, and Mr. Champion made remarks on their geographical distribution.

Prof. Scudder exhibited the type-specimen of a fossil butterfly—*Prodryas persephone*—found in beds of Tertiary Age (Oligocene) at Florissant, Colorado. He said the species belonged to the *Nymphalidæ*, and the specimen was remarkable as being in more perfect condition than any fossil butterfly from the European Tertiaries. He also stated that he had found a bed near the White River on the borders of Utah, in which insects were even more abundant than in the Florissant beds.

Mr. Goss exhibited hybernating larvæ of *Spilothyrus alceæ*, which had been sent to him by Mr. F. Bromilow from St. Maurice, Nice.

Mr. W. F. H. Blandford read a paper entitled "The Rhynchophorous Coleoptera of Japan. Part III. Scolytidæ."

Mr. G. T. Bethune-Baker read a paper entitled "Notes on some Lepidoptera received from the neighbourhood of Alexandria," and exhibited the specimens.

Mr. C. O. Waterhouse read "Further Observations on the Tea-Bug (*Helopeltis*) of India"; and Dr. F. A. Dixey communicated a paper "On the Phylogeny of the *Pierinæ*, as illustrated by their wing-markings and Geographical Distribution."—H. Goss and W. W. Fowler, *Hon. Secretaries.*

NOTICES OF NEW BOOKS.

Horns and Hoofs; or, Chapters on Hoofed Animals. By R. LYDEKKER. 8vo, pp. i–vii, 1–400, with 82 illustrations. London: Horace Cox. 1893.

THIS volume consists mainly of a reprint of articles contributed to the natural-history columns of 'The Field' during the last two or three years, with one or two from other journals; but the author informs us in his Preface that, since their original appearance, several of the chapters have been more or less recast, in order to bring them up to the present state of zoological knowledge, while they have been embellished by the addition of a number of new illustrations. All the animals dealt with in the work come under the designation of Big-game, but include only certain groups of the order *Ungulata.* The reason of this limitation we are unable to understand, nor is any explanation given in the Preface for the omission of such highly important species as the Wapiti, Black-tailed, Virginian, and Mule Deer, Pronghorn Antelope, and Rocky Mountain Goat. The American Moose is very cursorily referred to (pp. 321–322) under the head of Elk in the chapter on Asiatic Deer, and the account given of the Big-horn, *Ovis canadensis,* is wholly inadequate, notwithstanding the two good illustrations of the head and skull of the Kamschatkan race, *Ovis nivicola,* reproduced from Guillemard's 'Cruise of the Marchesa.' This omission of the North American *Ungulata,* above mentioned, is a serious defect in a book which, from its title, would naturally be supposed to be thoroughly comprehensive.

Even in the case of the American Bison, to which some six or seven pages are devoted, we find little more than quotation from Mr. Hornaday's recent book on this animal (Washington, 1889), while the much more important monograph by Mr. J. J. Allen on 'American Bisons, living and extinct' (published with twelve plates and a map in the 'Memoirs of the Museum of Comparative Zoology at Harvard College') is not even so much as mentioned.

Leaving the North American species, then, out of consideration, the groups dealt with are Wild Oxen, Wild Sheep, Wild Goats, the Antelopes of Asia, African Antelopes, the Deer of Asia, the Deer of South America, Wild Pigs, and Rhinoceroses, ancient and modern. None of these chapters are exhaustive, and some of them are even meagre in their details. Perhaps the best of them is that on African Antelopes, and this is fairly well illustrated.

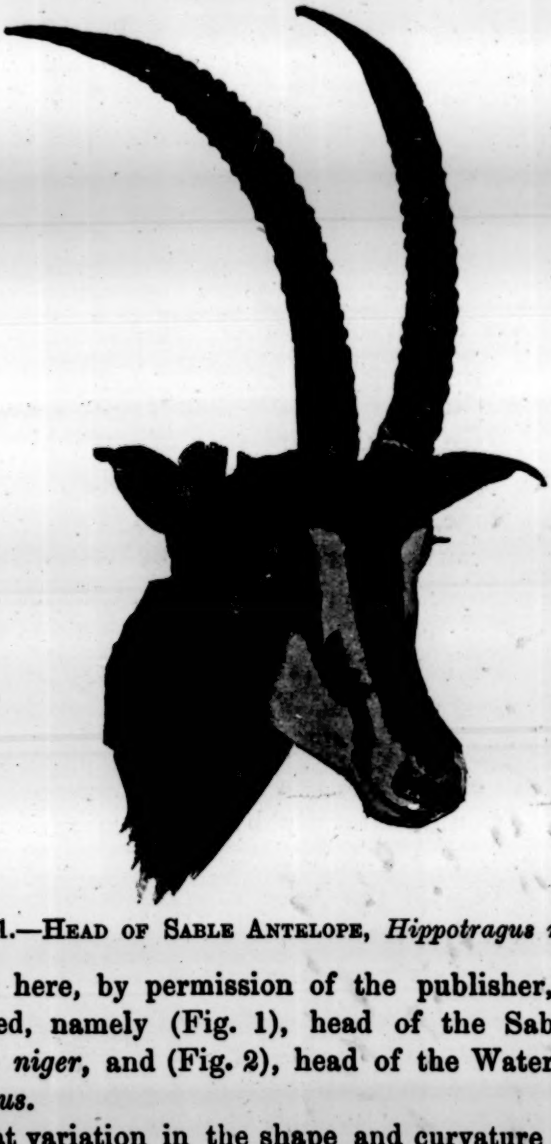


FIG. 1.—HEAD OF SABLE ANTELOPE, *Hippotragus niger*.

We give here, by permission of the publisher, two of the heads figured, namely (Fig. 1), head of the Sable Antelope, *Hippotragus niger*, and (Fig. 2), head of the Waterbuck, *Cobus ellipsiprymnus*.

The great variation in the shape and curvature of the horns in the African Antelopes is very remarkable, and has led to considerable difficulty in the way of systematic classification. As a rule, they are more or less lyrate in shape, with a subcircular cross-section, and an upward direction. They may,

however, be almost straight, as in the Gemsbok (*Oryx*); curved backwards and marked by bold rings as in the Sable Antelope (*Hippotragus*); ridged and spirally twisted, either on its own axis, as in the Eland (*Oreas*), or in a corkscrew shape, as in the Kudu (*Strepsiceros*), or sharply bent down and then upturned, as in the Gnu (*Conochetes*). In the Hartebeests (*Bubalis*), we have a different form again. In this genus the horns are characterised by a remarkable divergence at the base, so much so that in one

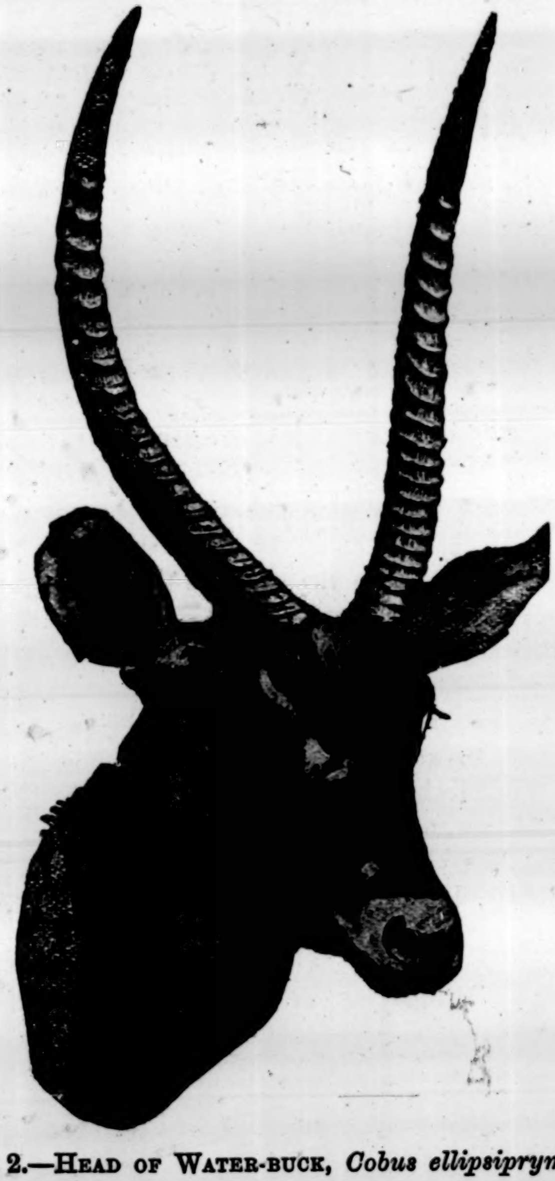


FIG. 2.—HEAD OF WATER-BUCK, *Cobus ellipsiprymnus*.

species (Cooke's Hartebeest) they form a right angle with the middle line of the face. In no case, however, do the horns assume the characteristic form and curvature of the true goats, or sheep.

As to what constitutes the difference between Wild Sheep (clothed as they are with *hair* instead of *wool*), Mr. Lydekker remarks:—

"All species of Sheep have glands in both hind and fore feet, whereas in the Goats these glands, if present at all, occur only in the fore feet. In the Oxen they are invariably absent. The absence of a true beard on the chin,* and also of a strongly-marked odour in the males of sheep, are important points of distinction from the goats. In the more typical species of sheep, the horns are triangular, and marked by parallel transverse wrinkles, extending completely round them, their first curve being directed downwards and forwards, and the second curve turned outwards; while their colour is either light brown or greenish [*quære*, greyish] brown. Certain species of sheep, however, such as the Bharal of Thibet (*Ovis nahura*) [with smaller, smoother, and more spreading horns], present so marked an approximation to the goats in the structure of their horns as well as in some other features, that it is extremely difficult, if not impossible, to draw up a concise definition between the two groups so far as these points are concerned.

"So closely related, indeed, are the sheep to the goats, that Dr. A. R. Wallace, in his well-known 'Geographical Distribution of Animals,' has proposed to include the whole of them in a single genus—the genus *Capra* of Linnæus. This view, however, has not commended itself to the majority of zoologists, who class all the sheep in the genus *Ovis*. In this respect, therefore, zoologists and sportsmen are for once in accord, and although, as already mentioned, some of the more aberrant species of sheep approximate to the goats in several respects, yet neither zoologists nor sportsmen find any practical difficulty in deciding to which group any species brought for the first time under their notice should be referred."

The chapter on Asiatic Deer is an interesting one, dealing as it does with a large number of species; but it is disappointing in the brevity with which each species is treated. If economy of space were an object, it would have been useful to have referred the reader to other works in which some account of the haunts and habits of these animals are given from personal observation. For example, under the head of *Cervus maral*, Mr. Lydekker might have quoted or referred to the interesting account of this fine deer given by Col. Gordon in his 'Roof of the World,' as he quaintly termed his volume of travels in Turkestan.

---

* In *Ovis cycloceros*, however, of Northern India, we have an intermediate form with a beard on the throat.—Ed.

By the way, the Gazelle of Turkestan (or, as the people there call it, *Djeran*), of which Col. Gordon shot a fine example at Togha Sulvok, between forty and fifty miles from Maralbashi (the Stag's haunt), is not noticed by Mr. Lydekker. It is described (*op. cit.* p. 71) as "measuring 27½ inches at the shoulder, and resembling the Indian Gazelle [which stands 26 in. only at the shoulder], except that the horns are larger, and curve outwards, the tips being turned sharply inwards towards one another, making a very handsome head." We presume this must be the Persian Gazelle, *Gazella subgutturosa*, which, according to Mr. Blanford ('Mammalia of British India,' p. 528), is found not only throughout the highlands of Persia, but over a considerable area in Central Asia, extending through Eastern Turkestan to the Gobi desert. It has been well described and figured by Mr. Blanford in his account of the Mammals of the Yarkand Expedition.

But, to return to Mr. Lydekker. His book, as it seems to us, is a disappointing one. A fine theme is inadequately treated. There are gaps remaining to be filled, and many references to be supplied, before it can take rank as a satisfactory handbook on the subject of which it treats. No doubt, as a popular exposition of the great groups of Ungulates, with brief notices of the species, and figures of the heads of many of them, it will serve a useful purpose; but it is not worthy of the author's reputation. Let us hope that in a future edition the defects will be remedied, including the substitution of "capitals" for "lower-case" initials to the English specific names, which are very irritating to a busy reader.

Travel and Adventure in South-east Africa: being the narrative of the last eleven years spent by the Author on the Zambesi and its tributaries; with an account of the colonization of Mashunaland, and the progress of the gold industry in that country. By F. C. Selous. 8vo, pp. i—xv, 1—503. With 24 full-page illustrations, and numerous text-cuts. London: Rowland Ward & Co. 1893.

Eleven years ago we had the pleasure of reviewing (Zool. 1882, p. 78) the first work published by Mr. Selous, namely, his

'Hunter's Wanderings in Africa,' which was a narrative of nine years spent amongst the game of the far interior of South Africa. In the opinion of naturalists, explorers, and sportsmen, it was the best modern book of its kind, and the praise which we then bestowed upon it was speedily justified by the book going out of print, and a second edition being called for. In the long interval which has elapsed Mr. Selous has been again "wandering" in his happy hunting grounds, and the volume now before us contains the narrative of his further adventures during his eleven years of absence.

It is indeed a stirring narrative, and one calculated to excite the admiration and envy of sportsmen and naturalists. We place the sportsman first on this occasion, because it is as a hunter of "big-game" that Mr. Selous conspicuously excels. Few have had longer experience or better opportunities for observing the wild animals of South Africa in their natural haunts, and none, we should imagine, have been more successful in chasing and slaying them.

As a mere record of sport his book is instructive, setting clearly before the reader the qualifications necessary to constitute a hunter. One of the first essentials is a knowledge of the country, and this is only to be gained by experience such as Mr. Selous has acquired in years of travel. Then an insight into native character is important to enable one to set a proper value on replies given to questions, and to escape attempted imposition. A knowledge of "tracking" is almost indispensable, not only for the purpose of following hunted game, but to enable one to find one's way back to camp after a long and perhaps intricate chase in a new and difficult country. This may often be rendered unnecessary by the services of native hunters, to whom one may turn for assistance; but it is as well not to rely too much upon attendants, in case of accident, or separation from the party, when one's own safety may depend upon a little self-reliance, and the exercise of independent judgment. Resolution and nerve, it goes without saying, are all-important in such undertakings, as well as fertility of resource and promptness of action in an emergency. Expertness in the saddle and with the rifle are qualifications without which but little success can be hoped for or expected, and some knowledge of the habits of the animals hunted is almost a *sine quà non*, although this may be acquired by experience and by the teachings of others. Lastly, if the object of the sportsman be to secure trophies of the chase for transport to England, it is evident that he should know how to take off a skin and preserve it.

These are some of the qualities which go to make a mighty hunter (such as the author of this book evidently is), and which are admirably brought out in his narrative. It does not always do, however, to be too self-reliant; one should draw the line between courage and foolhardiness, as witness the adventure with lions described on pages 144–145.

Two small objects were seen out in the open plain the best part of a mile off, looking like two ant-heaps. They proved to be lions' heads, and this was what happened:—

> "The animals got up, and were walking slowly over the open plain, one behind the other. I saw at once that they were lions from the length of their bodies, and the way they held their heads below the line of their backs. I could see, too, that they were males, from the thick humpy look of their necks caused by the mane. Oh, for a rifle and ten cartridges, and then, as I was very well mounted, I should in all probability have added two more lion-skins to my collection. Thinking that, as I could not shoot them, I would like to have a look at them, I mounted my good horse, Bob, and galloped towards them. They continued to walk slowly along, until I was within 400 yards of them, when, after first turning to look at me, they went off at a heavy canter, but soon commenced to trot, and when I was about 200 yards from them stopped, and facing round stood side by side with their heads held low and their mouths slightly open, and all the time twitching their tails and growling savagely. I continued to ride straight towards them, thinking they would give way and run again; but when within about 100 yards, as they still stood defiant, and one of them, a very fine dark-skinned animal with a handsome mane, seemed particularly furious, I slightly turned my horse's head so as to pass them at a distance of sixty or seventy yards. Whilst executing this movement, the dark-maned lion came slowly towards me for a few steps, and then, bounding forward and growling loudly, charged out at his best speed. As I had to half turn my horse and get him into his stride, the lion got within some ten yards or so of his tail before he was going at his best pace, and stuck close to him for some distance. How far he chased me I am afraid to say, but a very considerable distance, and certainly twice as far as I have ever been pursued by any other of his kind. When at last he pulled up, he trotted slowly back to his comrade, and they both lay down on the bare open ground, with their massive paws outstretched, their heads held high, and their mouths half open, with their tongues lolling out, for it was a very hot day."

After this observation on the attitudes of lions, the following criticism upon the positions of Sir Edwin Landseer's bronze lions in Trafalgar Square is worth quoting, as coming from one well qualified to judge:—

> "They lay almost exactly in the position of Landseer's lions in Trafalgar Square, and it is quite a mistake to say that that great artist has made an error in representing lions lying with the fore paws straight out like a dog. When on the alert a lion always lies like this, and only bends his paws inwards, like a cat, when resting thoroughly at his ease."—(P. 147).

On page 32 we have given a figure of the head of the Sable Antelope. The way in which this animal is able to defend itself with its horns, in spite of their backward curvature, is thus graphically described by Mr. Selous:—

> "The foremost dogs soon caught sight of the Sable Antelope, which, badly wounded by Van Rooyen's bullet, was making off slowly towards the stream which ran down the centre of the open ground. We ran as hard as we could to call the pack off, and despatch the beast before any of our valuable dogs were killed; for we knew from experience what havoc a wounded Sable Antelope can make amongst a pack with its long and curved horns. Just as we were nearing the water, two of my own dogs came howling up the bank, both badly wounded, and the loud barking of the rest of the pack, coupled with the defiant snorts of the Antelope which proceeded from the bed of the stream, let us know that the brave beast was still making a gallant fight, and doing his utmost to sell his life dearly. A moment later we despatched him with two bullets through the head and neck, and not a moment too soon. Four of our best dogs lay dead around their quarry; four more were badly wounded, one of which subsequently died. My old bitch 'Ruby' had one more very narrow escape. She had been struck right through the throat by the sharp horns of the Antelope, though fortunately it had only pierced through between the skin and the windpipe.
>
> "I have mentioned this instance of the able manner in which a Sable Antelope can use its horns when beset by dogs, to show that these animals are often very savage when wounded, and I would caution young sportsmen against approaching either a sable or a roan antelope, a gemsbuck, or a wildebeest, when any of these animals are standing at bay." — (Pp. 191–192).

Apropos of Ostriches:—Many persons suppose, and indeed it has been stated on high authority, that the process of incubation is carried on by the male bird only. This is a mistake, as we have elsewhere had occasion to point out*; and the observations of Mr. Selous, which follow, confirm the view we have expressed:—

"At mid-day on the 16th July I found myself on the edge of the broken country in which the Mazoe takes its rise. * * * * * It was getting late in the afternoon, when I suddenly descried a black speck, which looked like an Ostrich, far away in the distance. Pulling in my horse, I looked intently at it. As I did so, it suddenly disappeared. I felt sure that it had lain down in the grass, and knew that if it really had been an Ostrich, it was very probable that it had a nest there, for it was the breeding season for these birds. I accordingly rode steadily in the direction where whatever it was I had seen had disappeared, and at length began to think I had overridden it, when up jumped a hen Ostrich from a little patch of long grass, about eighty yards in front of me, and ran away slowly with outstretched drooping wings and lowered neck. I might have had a splendid shot at her, *but from the way she ran I knew she had got off her nest*, and so did not fire, as I felt sure that if I now went the right way to work, I should in all probability be able to secure the cock bird. Riding up to the patch of grass from which the hen bird had risen I saw she had a nest there containing thirteen eggs."—(P. 82.)

Further on he makes the state of the case clearer:—

"Between Inyati and the Umniati river we did not find very much game. * * * Just after crossing the river Vungo, Jameson and I, having taken a ride round, *came upon a hen Ostrich on her nest.* We went up to the nest, which was just a large shallow hole scratched in the sandy soil, and found that it contained twelve eggs. Thinking that either the cock or the hen would put in an appearance just at sunset, *which is the time these birds relieve one another whilst incubating*, we cleared out a little space in the centre of a small thick bush, about thirty yards from the nest, in which my friend took up his position. * * * * * * He shot the hen bird as she was returning to the nest just at sunset. She was in very good plumage, and worth about £10, the feathers of a fine cock being worth about £25 at that time. The next day we sent some Kafirs back for the eggs, of which we afterwards made some very good omelettes and pancakes."—(P. 463).

Amongst other stirring incidents related in this book is a curious case of cattle struck by lightning, which is thus described:—

"In December, 1882, I was travelling south from the Matabili country, and was in charge of about a hundred head of cattle belonging to

---

* See 'Nature,' March 22nd, 1883.

> Mr. Fairbairn, a well-known trader. I was just inspanning the waggons one afternoon amongst the hills skirting the Inkwesi river, when a heavy storm of rain came on, accompanied by much thunder and lightning. The boys herding Mr. Fairbairn's cattle now drove them up alongside of the waggons, and they stood thickly clustered together amongst the trees. Suddenly from where I stood in front of my waggon, I saw some splinters of wood fly from a tree near me—about sixty hards off—whilst all the cattle standing beneath it fell to the ground. On going up to see what had happened, I found thirteen fine oxen lying dead. Most of them must have had their heads down feeding, and had been struck dead so instantaneously, and fallen so suddenly, that their necks and heads were bent in, under their bodies. I could not get a Kafir to come near the dead animals, and they seemed quite frightened at what had occurred. I turned all the carcases over, but could find no mark of any kind upon them."—(P. 447).

With this extract we must close the volume, although we had marked several other passages for quotation. To the general reader, probably, the most interesting portion of the book will be that which relates to the occupation of Mashunaland, and the guidance of an expedition by Mr. Selous to a spot on the Makabise river, about ten miles S.E. of Mount Hampden, where, on Sept. 11th, 1889, the British flag was hoisted, and the country taken possession of in the name of the Queen ; and here the town of Salisbury was soon after laid out.

But we must not be led into a discussion of politics, which would carry us entirely out of our province. We must be content to refer the reader to Mr. Selous's vindication of the justice of the occupation of Mashunaland (in spite of the indignant protests of Portuguese statesmen), as explained by him in a letter to 'The Times,' which is here reprinted (pp. 313–325).

We note that the spelling of native names adopted by the author is that recommended by the Royal Geographical Society, and Mr. Selous has been fortunate in getting his MS. revised by so good an authority as Mr. John Coles, the Map Curator of that Society. The publishers, Messrs. Rowland Ward & Co., seem to have spared no expense in the production of this book, which has been beautifully printed by Clark, of Edinburgh, and is well illustrated by such good artists as Messrs. Wolf, Whymper, Lodge, and others. A map at the end shows the routes traversed by the author during the past eleven years, and, with the aid of the text, furnishes a valuable contribution to geographical science.

BRITISH 13 AU 94